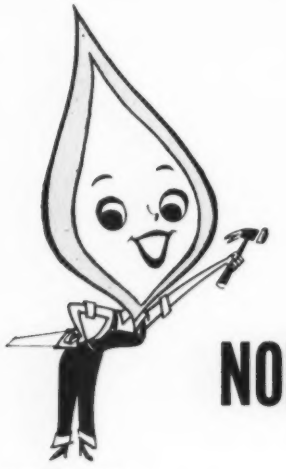
Midwest Engineer

SERVING THE ENGINEERING PROFESSION

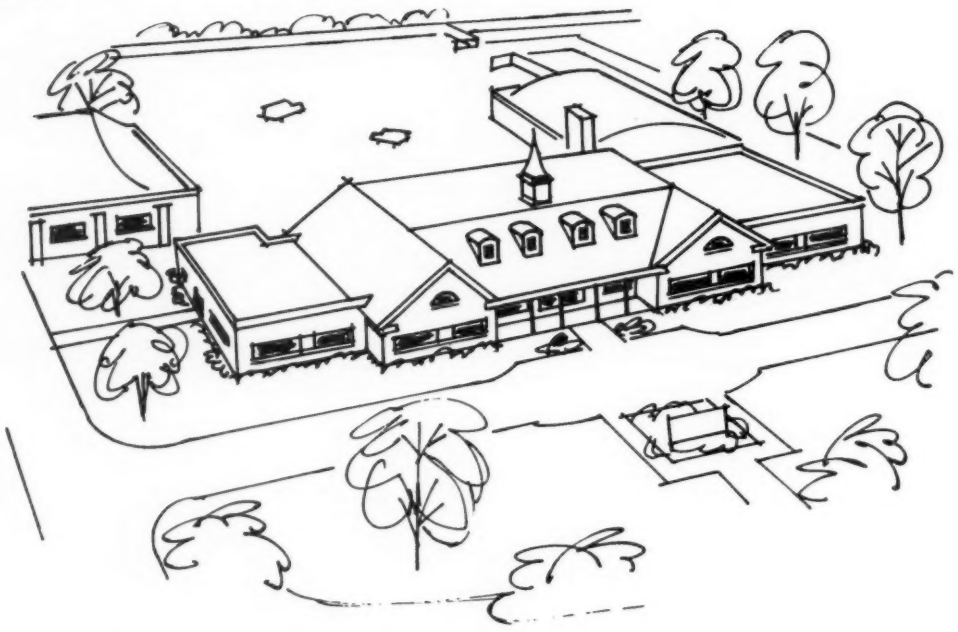
WESTERN SOCIETY OF ENGINEERS FOUNDED 1869

SPUTNIK, SCIENCE AND HUMANITY — PAGE THREE

Vol. 10 MARCH, 1958 No. 10



We're in business at our NEW NORTHERN DIVISION HEADQUARTERS



Penny Flame is extremely proud of our new Northern Division Headquarters at 100 Shermer Road in Glenview, and justly so. In keeping with today's trend in community development, its attractive exterior conforms to the predominantly residential character of the area. Throughout the building there is "everything it takes", including gas air conditioning, for efficient operations. These modern quarters replace the outmoded facilities on the fringe of Evanston's business district. They bring our activities closer to the center of population of our rapidly growing Northern Division . . . an important advantage that makes for even better service now and in the years ahead. Glenview Headquarters is one of many important projects in the substantial construction program we have undertaken to keep pace with the growing use of gas throughout northern Illinois.

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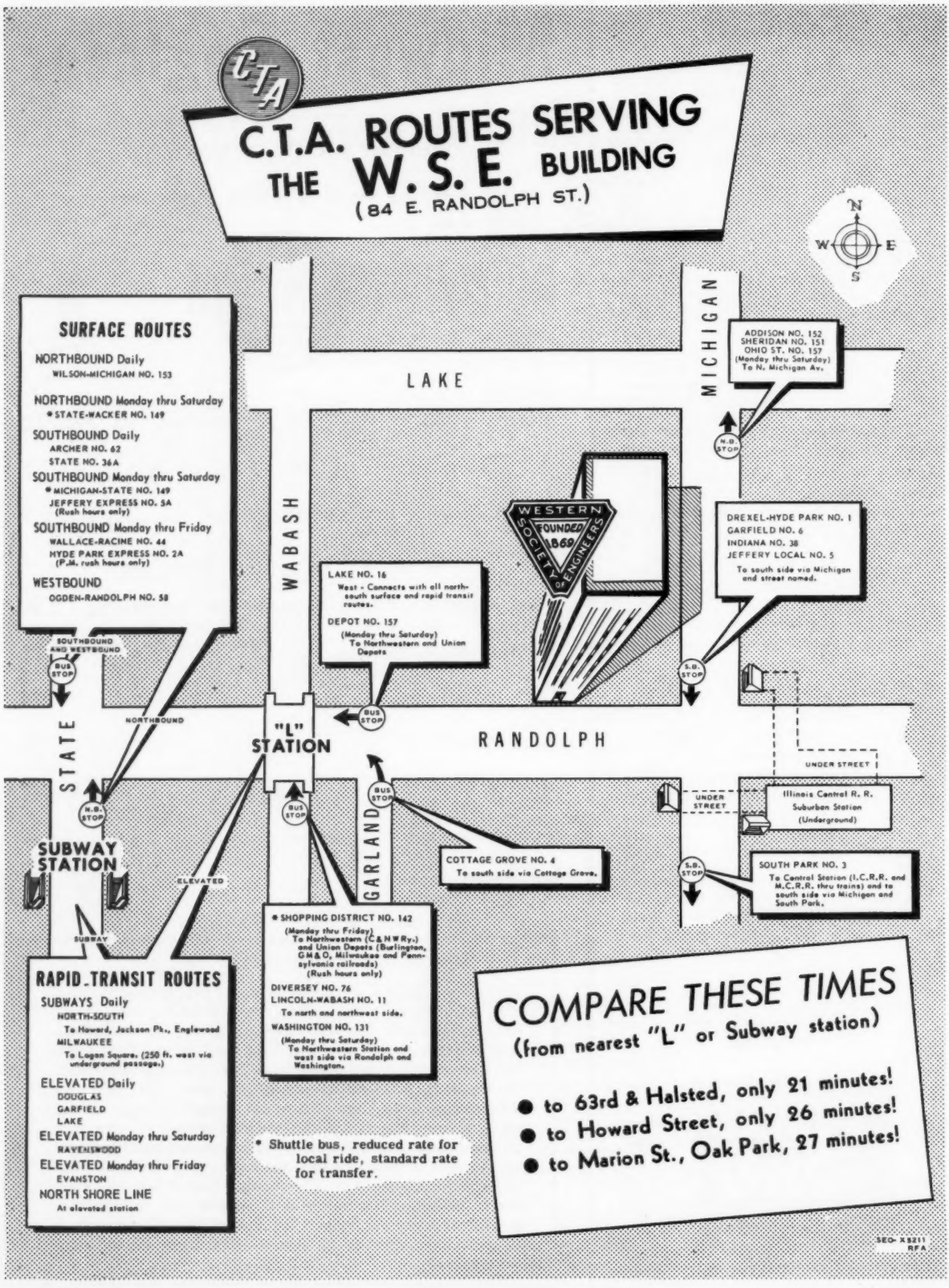
March, 1958 Vol. 10, No. 10

CONTENTS

COVER STORY

The first building of its size to be built in Chicago's Loop area in 24 years, the Inland Steel Building, among other 'firsts,' is the largest ever built with exterior supports. Seven built-up steel columns on the east and west faces support the entire 19-story structure which presents a clear span for each floor. The building is sheathed in stainless steel and glass; air conditioned throughout. Access is through 25-story service shaft to east. The shaft also contains stairways, elevators, air conditioning, washrooms. Interior movable partitions over wall-to-wall carpeting allow quick rearrangement of floor space in multiples of 5' 2" module. Inland has top eight floors. Chicago Association of Commerce and Industry has ground and second floors. The first of three basements is 60-car parking garage for tenants. See page 32 for more information.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RANDOLPH
GARLAND
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SHERIDAN NO. 151
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Sputnik, Science and Humanity

By John T. Rettaliata, MWSE

Deep in the mind of each of us here tonight . . . and in the minds of millions of people in America and other nations . . . is, I am sure, one thought . . . one hope . . . that transcends in importance all other considerations. That is the advancement of the welfare of humanity.

And of immediate concern to all Americans, is the well-being, happiness, and security of the United States. Upon the preservation and advancement of these things not only our own hope but much of the hope of the world depends.

In well-being, in happiness, and in security, science and technology play a vital part.

Four months ago the Russians launched the first artificial satellite. This came as a surprise to all but a few people in this country; to most it came as a shock. It was seen as endangering our national security, and a telling blow to our technological superiority.

Public reaction was instant and vigorous. The cry was for immediate action to neutralize this accomplishment of the Soviet scientists. There was a mingling of fear of science and hope that American science and technology could help preserve our way of life.

Now, as you know, an artificial satellite in orbit around the earth is not, in itself, a threat to the security of this or any other nation. Let us view it for what it is . . . an important advance in science and technology which *can* be used to extend the horizons of knowledge to the benefit of mankind.

What *is* disturbing, and properly so, is the threat inherent in a rapidly advancing technology under a Godless regime that is committed to a program of world domination. This is a challenge to American science and technology that cannot go unanswered, for the preservation of our freedom and that of other free nations of the world.

Dr. Rettaliata presented this address before the Chicago Sunday Evening Club on February 2, 1958. Dr. Rettaliata, treasurer of the Western Society of Engineers, is president of the Illinois Institute of Technology.

Two days ago, as you know, the United States launched *its* satellite. If American science needed exoneration, this has done it. While this is still no time for complacency, let us hope that some of the heretofore prevalent hysteria will now subside along with clamoring for expensive crash programs.

Another result of the launching of the sputnik was to focus public attention on education, at both the secondary and higher levels. It pointed up the cardinal role of scientific and engineering education in today's civilization, and emphasized the necessity of supporting and advancing the science and technology that are the foundation of our national security and our economic well-being.

There is no doubt that we must increase our competence in these fields, and that our colleges and universities must produce more qualified scientists and engineers. There is need to strengthen high school curricula in such basic subjects as mathematics and science, and we must encourage young people who have potential talent to pursue careers in science and engineering.

But in accomplishing this we must not let the sputnik scare cause us to over-emphasize the study of science and engineering to the detriment of other disciplines. While we need scientists and engineers, we also need people who are versed in literature, history, economics, political science and other subjects relating to the liberal arts field. In short, we need balanced education, and we will gain little if we enrich one field and impoverish the other areas of human activity.

Our goal must be more understanding by the scientist and engineer of social problems, and more understanding of science and technology by society generally. Attainment of this goal is essential to the solution of the problems of our complex and advancing technological civilization.

Science has given us great knowledge and power which in the hands of evil men are a threat that is terrible to contemplate.

But science also has given us a mighty force for good. The scientist is concerned with the study of the forces of nature and the discovery of new knowledge. The engineer utilizes this knowledge and the forces and materials of nature for the benefit of mankind. These are the historic objectives of science and technology, to the attainment and protection of which the American scientist and engineer are dedicated.

Let us, therefore, turn to the credit side of the ledger and review the contributions of science and technology to a better and fuller way of life. It is a record that is well worth retelling, in times such as these.

I would begin by stating that science and technology have enabled this nation of more than 172,000,000 people to reach the highest standard of living ever attained by man on earth, anywhere, anytime.

Our productivity, founded on science and technology, is enabling American industry to turn out annually more than half the yearly total world production. And it is produced by but seven per cent of the world's population.

And because of science, most of man's bodily ills are now under control.

For the people of this city, state and nation, science has, on the average, added more than 20 years of life, compared with life expectancy at the beginning of the present century. Without science, pestilence and disease would stalk the earth.

Without technology, communication would be a matter of mounted couriers and beacon lights on hills. Women would be condemned to drudgery in the home. Farming would be a form of serfdom, instead of the high professional occupation to which science and technology have elevated it.

Hard unrelenting physical toil would undoubtedly be the lot of most of us

gathered here . . . and yield us a bleak living at best.

Even as I recall these things to you, I can sense the question: "Isn't the greatest need now to make human rather than physical discoveries; to make social rather than material gains?"

Herein lies the heart of an old challenge to science, the belief that science and technology fundamentally contribute little to the non-material advance of civilization.

It is my conviction that science and technology are having profound and beneficial effects upon our social order. It is my belief that science is providing us with the means to attain many of the age-old goals of the idealists, and that it is laying the foundation upon which we can ultimately build the moral and spiritual order that the heart and soul of man have always craved.

What, then, are some of the contributions of science in the value areas of life? Let me mention just a few.

Social inequality has marked the pages of all human history. Struggle between the haves and the have-nots has scarred all ages.

Today, science and technology are bringing abundance for all within reach of attainment—for the first time in history. By bringing the creature comforts and the good things of life to the great bulk of the population, they have done more to reduce the festers of class hate and of class envy, and to obliterate class distinctions, than all the labors of the world's utopian and socialist dreamers.

It has always seemed to me that socialism consists essentially of a leveling *down* process. Science and technology are showing us how all men may be leveled *up*.

Science and technology are rapidly creating a new economic order in America, with profound social consequences.

The productivity of the machine is making possible an increasing equity in the distribution of profits. By augmenting the saving and investing power of the mass of the population, ownership in America is being widely distributed. More than 15,000,000 men and women are now shareholders in American industry. The fundamental forces of science and technology are thus creating something of revolutionary consequences for the future: popular capitalism.

Constantly rising standards of living have other far-reaching effects. They are bringing higher education within the reach of all who seek it.

Science has given mobility to all men. Except for migrations, most people of earlier generations have been condemned to live out life within the narrow confines of some small corner of the globe.

Today, every part of the world is within easy access. Science and technology have given even the humblest of us freedom of movement. By heightening the contacts between men, by enlarging their experience, men's minds and spirits are inevitably broadened. And another child of science . . . the electronic calculator, is freeing men's minds from the mental drudgery involved in many vital tasks.

Science is widening our artistic expression . . . and it is increasing artistic appreciation. The thousands of objects of daily living which surround us today are adorned in a measure undreamed of a few years ago. Mass production has fostered a new kind of creativeness in the world, and is bringing art where I think it belongs best . . . in the surroundings, the articles, the offices, homes, and the workshops of all of us.

Science has brought increasing leisure to mankind and given men more time for creative pursuits, as well as more time for recreation.

Great civilizations in the past have risen only to stagnate. Science makes stagnation of our society virtually impossible. For science, research and the stream of discoveries that flow from them, are the nation's great energizing force.

Perhaps many of you can recall, a few years ago, that we were widely regarded as a maturing society. Many were even willing to write off America as unfinished business. Now science and technology present boundless frontiers to us. We are the most dynamic society in the world. We shall continue to be so, I am confident, through the constant advance of science and technology.

Man's individual happiness consists, of course, of a host of indefinable things. High among the influences that we can identify as contributing to the personal happiness of each of us is happiness in our work and chosen occupation.

One of the great social results which science is offering us is through the creation of new and interesting jobs. The vast choices of work opened today through our scientific and technological discoveries are indicated by the existence of more than 30,000 different occupations. Science is thus eliminating the great problem of the square peg in the round hole.

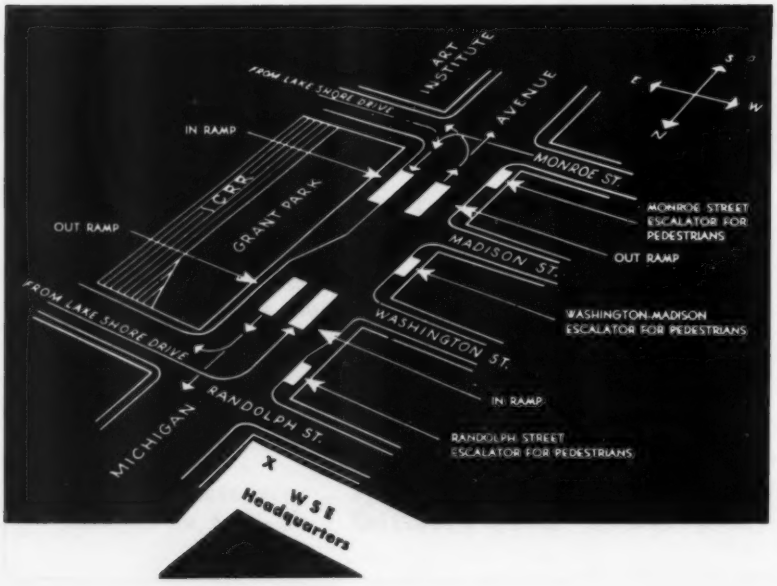
Generosity characterizes this nation as no other. Productivity through science

SAY, ENGINEER!

Do you like to DRIVE?

Then why not drive to WSE meetings and other functions? There's plenty of PARKING almost at the door—the Underground Garage is diagonally across the street from WSE Headquarters (see the map below), two private garages are a block west, and the State-Wacker "Bird Cage" Garage is only a short distance away.

Below: map showing Park Department Underground Garage



Interior view of Underground Garage

If you're not driving it's still convenient to get to and from WSE meetings.

Here are handy stations or stops:

- The Cab Stand is just across the street
- The Elevated is one block west
- The Subway is two blocks west
- Buses stop at the door or within a few blocks for every part of town
- The IC Suburban station is across the street
- Other suburban stations are conveniently served by bus or elevated.

You see, your WSE Headquarters is at the handiest place in Chicago.

ENTER at either Monroe or Randolph Street on Michigan

EASY access, Speedy exit

ESCALATORS convey you to street level

CAPACITY The garage with its 2359 parking spaces, is designed to prevent overcrowding.

and technology has given us the means to be generous.

We are sharing the fruits of our enterprise with other peoples, and we are helping saves the lives of whole nations.

Here at home, individuals and corporations, out of the abundance made possible by science and technology, give to philanthropic causes something estimated at well in excess of $6,000,000,000 each year. Thus, abundance makes for goodness of the heart, as well as for material well-being.

Science and technology create the wealth which supports our churches, our museums, our libraries and other means of intellectual and cultural advancement.

These are but a few of the examples I could point out of the extraordinary and diverse ways in which we are making material things serve higher ends. We shall, I am sure, continue to do so as science and technology ever enlarge our powers of creation.

Despite our use of the fruits of science and technology for social progress, and for the improvement of the quality of life, there still remains unresolved the ultimate problem with which science has presented us: nuclear weapons.

It is idle to wish that discovery postponed for future and more mature generations to handle. It has been made. It is here. It is inescapable. But it may not be as bad as we think it is!

It is possible now, I think, to regard the atomic bomb and the use of atomic power in a far more hopeful light than when that instrument first came to fruition on that fateful day of July 16, 1945, and the subsequent discovery that Russia also had the bomb.

I see these grounds for hope.

First, scientific and technological superiority have enabled us in the ensuing years to hold at bay the menace to our social system of Russia's competing order. I am confident that by maintaining that superiority we can continue permanently to quarantine that force of evil.

Secondly, if atomic and hydrogen bombs suddenly and vastly widened man's possible choice of good or evil, further advances in nuclear knowledge, and other discoveries that are imminent, are widening it even more.

They are widening it so greatly and rapidly that I cannot come to any conclusion other than that the choice of evil use is about to become virtually impossible. I think this is becoming increasingly evident, even behind the Iron Curtain.

In my opinion, World War III will never happen. The certainty of retaliatory annihilation of an aggressor nation will be the deterrent to any global conflict. We may still witness limited skirmishes between nations but nothing of great magnitude. As I see it, no nation will ever use the hydrogen bomb against an enemy.

Science has thus been steadily moving considerations of good and evil to a top place in the thoughts of men everywhere on the globe. Science is compelling *all* men to think in terms of ultimate values and ultimate ends. And, to a degree perhaps never attained before, science is making men think in terms of the whole of mankind.

Thus, I see science and its advance turning out to be, not the specter it may temporarily seem to be, but a force that is hastening the process of man's moral and spiritual development.

I am, therefore, far more optimistic today than a few short years ago—far more aware of the ultimate force for good residing in science and technology, and in the part which you people can and do play in its beneficial applications.

Finally, ladies and gentlemen, let me mention one other aspect of our life in America which is greater than all the other things of which I have spoken. This is not a creation of science and technology, but they have made possible its retention in times of strife and world tension.

I am thinking of the idea upon which this nation was founded . . . the idea of human freedom. It is freedom in all its manifestations . . . freedom to worship as we please . . . political freedom . . . the freedom of enterprise we see embodied in American business and industry . . . freedom of thought and inquiry . . . the freedom to pursue ideas and ideals.

These are our most cherished possessions, and the crucial ingredients of our way of life. Our science and technology are the foundations of our strength which has preserved the light of liberty for all to see.

As the world slowly rights itself in the years ahead through the efforts of right-thinking and competent individuals, I see an increasing measure of spiritual consequences flowing from scientific well-springs.

Science assures us of boundless increase for the future. It holds the promise of the good life for all. It gives us the means to fulfill man's deepest ideals.

And so, before this audience tonight, I would affirm my faith in a Supreme Being, my faith in science and technology, my faith in man himself, and in his destiny on this globe.

High Living

A roof lounge, its perimeter revolving around a stationary central core, will cap a 14-story office building planned in Honolulu, reports *Engineering News-Record*. The lounge will be the equivalent of the 17th floor. A roof-top garden restaurant will be located on the 15th floor level. At the 16th, air-conditioning, electrical and other machinery will be enclosed in a penthouse.

Cooperation on the St. Lawrence

The St. Lawrence International Seaway and Power Projects are an outstanding example of cooperation between two countries. Construction-wise, it is a particularly unique effort in that in one undertaking the United States and Canada are each using their own methods of construction. One complete session of the American Concrete Institute's 54th annual convention in Chicago was devoted to this joint effort, with emphasis being placed on the concrete work involved in the power project and in the seaway project.

The possibility of constructing the St. Lawrence River deep waterway has for many decades captured the imagination of Canadians and Americans. If the river could be deepened in certain places, notably between Cornwall and Montreal, and if the limitations of the 14-ft. Cornwall Canal, which by-passed the International Rapids could be overcome, then larger ocean-going ships would be able to penetrate the Great Lakes to the very heart of the continent, to the economic advantage of both Canada and the United States. The International Rapids also pointed up another possibility of the river—water power. There is about a 90 foot drop in the water level between Lake Ontario and Cornwall.

J. N. Mustard, assistant engineer-in-charge, Concrete Control Department, Research Division, Hydro-Electric Power Commission of Ontario, Toronto, described features of the St. Lawrence International Power Project. Concrete technology on the power project was described by Harry H. McLean, director, Public Works Laboratory, New York Department of Public Works, Albany. Features of the St. Lawrence International Seaway were covered by Gordon Kidd, concrete control engineer, St. Lawrence Seaway Authority, Montreal, and concrete technology on the seaway project was described by M. R. Smith, Office of the Chief of Engineers, Department of the Army, Washington, D.C.

Power Project. In the International Rapids section of the river, a $600,000,000 power project is being built by Hydro-Electric Power Commission of Ontario and the Power Authority of the State of New York. When construction is completed in 1960, the state of New York and the province of Ontario will share equally 1,640,000 kw of electricity. The three major structures are the powerhouse and dam on Barnhart Island, Long Sault Dam, and Iroquois Dam. Numerous minor structures are involved, as well as relocation and rebuilding of several villages.

In pointing out the differences in materials, methods, and concrete mixes used on the power dam, on which both American and Canadian contractors are working, it was noted that the basic concrete mix design requirements for the Canadian side were primarily the same as the American mixes, the main differences being in the exterior concrete. The Americans used 6 in. maximum size aggregate as compared to 3 in. maximum sized aggregate used by the Canadians.

The Americans used a blend of portland and natural cement in Barnhart Power Dam interior concrete, while the

Canadians used an all portland mix, except in special cases where heat reduction for shrinkage control was considered imperative they used fly ash as a partial cement replacement. The Americans specified and used Type II cement, while the Canadians used the "Canadian Standard" cement, which is comparable to the U.S. Type I.

In transporting and placing concrete, all transportation of concrete on the American side was by bucket or dumpster, and conveyor belts were not permitted. On the Canadian side, conveyor belts were used for transporting all concrete from the plant.

In general, all mass concrete on the American side was limited to a 5-ft. lift, while on the Canadian side lifts were permitted up to 35 ft. The Americans used steel forms, the Canadians used wood. The Americans used horizontal joints with no waterstops; the Canadians used 8-in. keyways and horizontal waterstops.

The final accomplishments were the same—schedules were met on time, and the international structure is taking its final form, ready to serve both nations in equal capacities.

Seaway Project. The seaway construction encompasses numerous locks, dredging and excavating canals, relocation of highways and railroads, modification of bridges, construction of dikes and retaining walls—with some of the work being coordinated with various power projects on the Canadian and American sides of the border.

In general, concrete was mixed and placed by standard methods. Differences in methods used were those caused or permitted by differences in the specifications.

In placing the concrete, specifications of the Canadian St. Lawrence Seaway Authority restricted dropping the concrete to 4 ft. The Corps of Engineers specifications (the construction agency for the St. Lawrence Seaway Development Corporation, which is the United States agency) restricted dropping the concrete to 5 ft. The thickness of layers specified by the Canadians was 12 in. and by the Corps of Engineers, 20 in. A major difference was in the height of lift. The Corps of Engineers restricted the height of lift to 5 ft, except where the cross section of the monolith was 16 ft or less in width, in which case the height of lift was restricted to 10 ft. The Canadian Seaway Authority did not restrict the height of lift. The Corps required that 120 hr must elapse between lifts; no time limitation was imposed by the Canadians.

Another major difference existed in the curing required by the two agencies. The Corps required that concrete be cured by keeping it moist for 14 days. Curing compounds were permitted only in isolated cases. The Canadians required moist curing for 7 days.

The 120-hr delay between placing successive lifts and the 5-ft lifts forced the U.S. contractors to spread out their operations more than the Canadians. The 14-day curing period and the 5-ft lifts required by the Corps also increased the costs of winter protection on their projects. Practically all the concrete on the Corps projects was placed during periods when heating would not be required. Their production was geared to complete concrete construction during warm weather. The Canadians placed concrete through the winter months.

Bright Light

The world's brightest electrical light has been installed atop an oil refinery in California, reports *Electrical World*. The beacon is a 2,500-watt mercury-vapor lamp, and it is used as a welcoming beam for the refinery.

Nickel is Processed By Electrorefining

Research scientists and engineers of The International Nickel Company of Canada, Limited, have developed a new process for the electrorefining of nickel, Ralph D. Parker, vice-president in charge of Canadian operations, announced March 10 in Toronto. He described the new method, developed after seven years of study, as a major achievement in chemical metallurgy.

A main feature of the process is the direct electrolysis of nickel matte, an artificial sulphide. This contrasts with the usual electrorefining methods, including those employed in the nickel industry, in which a metal anode is used. The new Inco process eliminates high-temperature oxidation and reduction operations, with attendant losses of metals and sulphur and selenium. Instead, nickel sulphide of low copper content from the Bessemer converter or other source can be cast directly into sulphide anodes and electrolyzed for the production of high quality nickel. Another unique feature of the process is that it permits, for the first time in nickel refining, the commercial recovery of elemental sulphur and selenium as valuable by-products, in addition to cobalt and precious metals conventionally recovered.

Argonne to Build Fuels Center

The Argonne National Laboratory has been authorized by the Atomic Energy Commission to construct a Fuels Technology Center at the laboratory site, near Lemont, Ill.

The center is expected to enable Argonne scientists to speed up and expand their efforts to develop technology to permit use of plutonium as a fuel in nuclear power reactors. These efforts will include the fabrication of fuel elements of various sizes and shapes for nuclear reactors. Work of this nature is now being done in temporary facilities.

A conceptual design study for the center has been completed by the architect-engineering firm of Singmaster & Breyer, New York City. John H. McKinley, Argonne business manager, said that he expects work on the definitive design of the facility to begin shortly. McKinley also said that he hopes to advertise for construction bids late this spring. Completion is expected early next year.

Cost of the new research center, one of the most modern facilities of its kind, is expected to be about $10,000,000. It will be designed to permit the safe handling of experimental nuclear fuels.

Plutonium research is complicated by the fact that this element is intensely radioactive. Because plutonium is chemically toxic and a strong emitter of alpha particles which create a health hazard, special facilities are necessary if it is to be handled safely. Such facilities are included in the plans for the center and account for a major part of its cost.

The center will consist of one building in the west area of the Argonne site. It will have a reinforced concrete structural frame, with exterior walls consisting of face brick with concrete block backup. The building will have a gross area of about 220,000 square feet and will include one- and two-story space, high bay areas and the necessary special equipment space.

The importance of the center was further emphasized by LeRoy Kelman, project engineer for Argonne on the new facilities, who said:

"The Fuels Technology Center will provide the special plutonium handling facilities that will permit us to speed up developmental work in this most necessary phase of power reactor technology." Kelman is a group leader in the Argonne Metallurgy Division.

The extensive plutonium studies under way at Argonne since the original wartime work of the Metallurgical Laboratory, as the laboratory was then named, have necessarily been on a laboratory scale in the scattered facilities of the Metallurgy Division, headed by Dr. Frank G. Foote.

Dr. Foote said that a special shop for the fabrication of fuel elements is the first step necessary to expand plutonium facilities to permit development of production-scale processes. A one-story shop of this kind has been constructed and is known as the Fuels Fabrication Facility. It is scheduled for operation early next year. The fabrication work is now being done in temporary facilities.

Plutonium is a man-made element which mainly has gained prominence in recent years as an important part of atomic and hydrogen weapons. The knowledge of scientists about the peaceful potentialities of plutonium has been limited because most of the research on this element stemmed from weapons needs.

The potential economic importance of plutonium as a nuclear reactor fuel arises from the fact that it can be made from uranium-238, which is relatively plentiful in nature. Uranium-238 is non-fissionable in its natural state, but it can be converted into fissionable plutonium.

Scientists know of three isotopes that can be obtained in appreciable quantities and give off heat through fission. They are: (1) Uranium-235, a fissionable isotope which comprises only 0.7 per cent of the uranium found in nature; (2) uranium-233, which is made from thorium in reactors; and (3) plutonium.

Non-fissionable uranium-238, which comprises 99.3 per cent of uranium as it occurs in nature, can be converted to fissionable plutonium by absorbing a neutron from fissioned uranium-235. If the amount of plutonium produced is more than the amount of uranium-235 consumed, the process is known as breeding. The Atomic Energy Commission has undertaken a program to develop technology to permit utilization of plutonium produced in breeder reactors. It is hoped that the use of plutonium as a fuel in breeder reactors can be developed.

Early in the nuclear energy program, plutonium was used as a fuel in Clementine, a fast neutron research reactor at the Commission's Los Alamos lab. Clementine, dismantled after six years of operation, demonstrated the feasibility of plutonium as a nuclear fuel.

The plutonium research at Argonne complements the work at Los Alamos. Both laboratories are doing research on breeder-type reactors which can use plutonium as a fuel. The Experimental Breeder Reactor No. 1, which was placed in operation in 1951 at the National Reactor Testing Station in Idaho, demonstrated the feasibility of breeding nuclear fuel in a reactor.

Argonne scientists are working on plans for Experimental Breeder Reactor No. 2 and expect to place it in operation in 1960 at the National Reactor Testing Station. The breeder-type reactor is one of the original five types of reactors being developed under the Atomic Energy Commission's civilian power reactor development program.

The proposed Experimental Breeder Reactor No. 2 will have a thermal output of 62,500 kilowatts and a net electrical output of 17,500 kilowatts. In the beginning it will have a U-235 alloy core which will be designed so that a plutonium alloy core can be substituted later. The EBR-2 is a prototype of a large-scale fast breeder reactor.

The Fuels Technology Center will also be equipped with modern metallurgical facilities for fundamental research and engineering studies of uranium, thorium and many other metals of interest to nuclear power reactor specialists.

The type of work to be performed in the Fuels Technology Center ranges from typical research laboratory experimentation, where work is performed on benches, in fume hoods and gloveboxes using scientific measurement apparatus, to operations which require small vacuum and resistance furnace installations, and to moderately large foundry and fabrication areas using rolling mills, extrusion presses, welding equipment and areas for machine shop operations.

Argonne National Laboratory is operated by the University of Chicago under contract to the U. S. Atomic Energy Commission.

Stereoscope is Tool Of Pipeline Engineer

The stereoscope, the living room "TV" entertainment of grandfather's day, is becoming a valuable tool for the highway and pipeline engineer, John H. Wolvin, of Chicago, told the convention of the American Society of Civil Engineers in Chicago on Feb. 24.

Wolvin, manager of the Chicago Aerial Survey, said that most engineering applications are best solved by aerial stereoscopic coverage, which gives a third dimension to photographs.

Discussing the Sonne continuous strip camera which permits large scale direct aerial photography for detailed study of terrain features, Wolvin said that the camera was extensively employed for beach reconnaissance and water depth determination during the war years. More recent research has added improvements to the equipment, enabling it to be used in support of engineering projects.

"Because of the nature of the photography, it is best suited to coverage of continuous strips of ground, rather than large areas," he said. "Pipe and transmission line routes are excellent examples of optimized application.

"Railroad and highway right-of-ways are also well-suited for the photography. Largely due to the current wide spread interest in expediting highway work, most of the recent applications have been in this field."

Continuous strip photography, he said, supplements rather than replaces precision mapping photography. Its primary advantage is ground detail, and as currently applied is performed at large scales; for example, 400 feet per inch and larger. Enlargements up to 10 times without sacrificing detail are possible.

WSE Sponsors EJC Regional Meeting

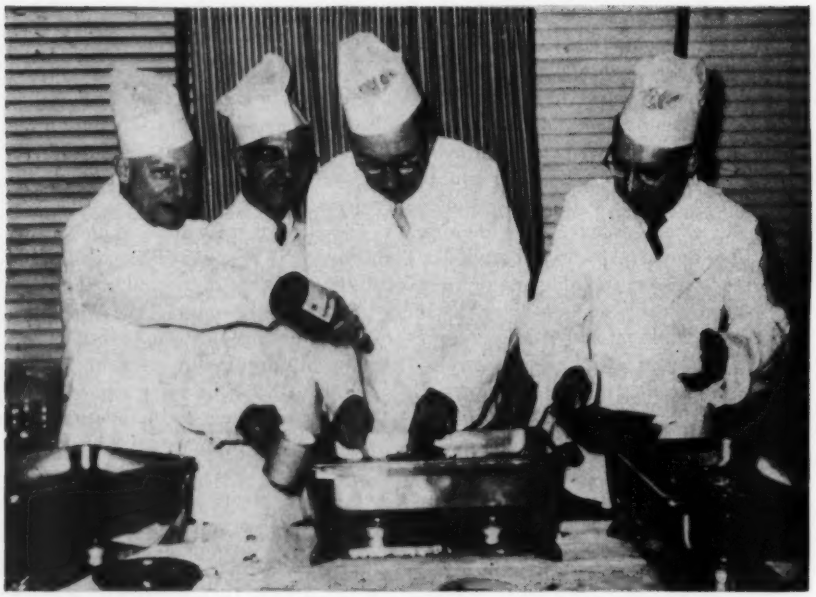
A one-day Regional Meeting of Engineers Joint Council, sponsored locally by the Western Society of Engineers, an E. J. C. member, will be held at the Sherman Hotel, Chicago, Monday, May 19, 1958.

Conferees will consider "The Next Decade In Engineering" in a series of meetings which will include "Survey of the Profession"; "Education and Manpower"; "Basic and Applied Research"; and "Government In Science and Engineering."

Local sections of the E. J. C. societies are cooperating in the meeting which will run from 9:00 a.m. to 5:00 p.m., including luncheon, at which there will be a prominent speaker. All engineers are welcome.

Novel Auto Door

Designed for tight parking spaces, a car door that pushes out to an external track, and then slides back outside the car, towards the rear wheel, has been designed by an Italian auto company, reports *Product Engineering.*



NIGHT in PARIS

It was a tourist's dream, that night in Paris. The Flea Market was its usual bustling self, with many intriguing bits of merchandise and novelties for sale. In the sidewalk cafe next to the Market the hors' d'oeuvres and refreshments were respectively delicious and refreshing; and the Montmartre dinner was all that could be desired.

At the *cinema* the picture *From Monaco to Manhattan*, in English, drew fascinated crowds.

It was a tourist's dream, or it could have been, for it was not really "Paris." It was the Western Society's own headquarters in a French disguise.

The Night was organized by a resourceful committee of WSE members' wives. The hors' d'oeuvres were served on the 6th floor lounge; the Montmartre dinner on the 5th floor. The Market items were contributed by members.

WSE member Robert H. Bacon narrated a color movie which he had produced on one of his trips about the world. The movie? Why, *From Monaco to Manhattan*.

Who were some of the many members enjoying the Night in Paris? Well, those busy gentlemen in the picture above are Past President George L. Jackson (left), Ralph F. Gross, President Ormas G. Smith, and 1st Vice President William R. Marston. Mr. Gross is also seen in the pictures below.

Missile Complications are Cited

Since we already know so much about missiles, why don't we have an IRBM or an ICBM?

If we can build a rocket that will travel 600 miles, why not just build parts a little larger and make a larger rocket?

For one reason, today's large missile system contains a million and a half parts, and getting them to work together is a problem of astronomical proportions, says Paul Lieberman, associate research engineer at Armour Research Foundation of IIT.

A homespun comparison is provided by the electric razor and the radio, he said. They work well individually, but not together.

"If a rocket were composed of only 500 parts which worked properly 999 times out of a thousand," he said, "the unit's probability of success would still be only 6 out of every 10 runs."

But Lieberman, who lectures on propulsion systems in a Chicago space travel series being given by Foundation scientists, is optimistic about rocket development.

The airplane is approaching its last days as the "prima donna" of the defense system, he believes. Delta wings and needle-nosed airplanes no longer represent the future.

"Just as the Model T-Ford, the harbinger of the hot-rod era, was absorbed by tradition, so too, the Mach 2 airplane will lose its glimmer in the wisp of Mach 15 missiles."

However, before that day comes, many problems remain to be solved. Among them, Lieberman lists such items as:

—For minimum weight, the missile propellant tanks must be paper-thin, but still withstand loads imposed by the throbbing and shock forces encountered in ground shipping and free flight.

—Some of the tanks must contain highly corrosive nitric acid, while others must withstand the contractions caused by liquid oxygen refrigerated at minus 298 degrees Fahrenheit.

—Powerful turbines must attain tens of thousands of revolutions per minute in a fraction of a second, while centrifugal and temperature forces permit but a few minutes lifespan for the turbine.

—Pumps driven by the turbine require high rotational speeds to move more than a half ton of propellants a second for a large missile.

—Valve design must be perfect. If there is any error in timing the accumulation of fuel can cause an explosion.

—Likewise, the system for spraying propellants into the combustion chamber must be perfect. (And research is hampered by the $10,000 price tag on a single injector for one large missile during the development phase when economies of mass production are not permitted.)

—Heat liberated upon reaction requires that 5600 - degree - Fahrenheit flames be contained by walls that lose their structural strength at 1200 degrees Fahrenheit, presenting complicated cooling problems.

Put these and many other problems together and you have some of the headaches of today's missile makers, Lieberman said.

"While the turbine winds up to thousands of revolutions per minute, and a half ton of propellants move through the system each second, 300-pound-per-square-inch pressures appear in the motor components."

This sudden surge causes transient vibrations that are violent enough to shake the rocket to pieces if they are encouraged by the inherent instability characteristics of the propellant lines, injector, and chamber, he pointed out.

And adding to this, combustion instability which appeared in rockets long ago still remains a crucial problem for the rocket engineer. Combustion in a rocket motor never is perfectly smooth, he said, and there are a wide variety of pressure fluctuations, a few of which seem to contain the punch needed to set off a particular destructive resonant condition.

These are among the reasons why the tasks of developing IRBM and ICBM missiles have not been overcome, and why it usually takes six years for a missile to become operational, Lieberman said.

However, it is only a matter of time before the unique problems of missile work will be solved, and before the dreams of science fiction writers come true.

"Technically and politically, the climate for development is proper, and most of us will see the space age in full bloom."

Miniaturization

A miniature slide rule only two inches long, and attached to a tie clasp is now on the market, reports *Product Engineering.*

Problem: Where to Get Water

"We know almost everything about water except where to get it.

"With water covering almost three-quarters of the earth's surface, the United States and many other countries face a shortage of fresh water to support industry and agriculture."

These observations were made by Dr. Ronald Vickery, head of the chemistry department of Horizons Incorporated, Cleveland, process and materials research organization.

"Daily precipitation in the U. S. is approximately 4,300 billion gallons — some 70 per cent of which recycles hydrologically. The remaining 30 per cent would be more than enough to support all our needs if it and our population were evenly distributed.

"But the water vs. population imbalance creates shortages in one area and surpluses in another."

According to Vickery, "the problem, basically one of distribution and run-off, could be solved in centuries by dams, reservoirs and coastline variations. But this will not meet the current critical need.

"For many years, men talked and dreamed of taking fresh water from the ocean. Research answered the challenge with several different processes. But no one has yet developed an economical means of producing large quantities of fresh water from saline seas."

Current research work, mainly sponsored by the government, takes several directions: Thermal distillation, solar distillation, electric membrane separation, osmotic processes, solvent extraction, separation by freezing and ultrasonic vibrations. All these processes have advantages, but none yet provide a complete answer.

The Horizons chemistry department head adds that "distillation processes face a drawback in scale formation at 160° F. This impedes fluid circulation, fouls heat exchangers, imposes higher operation costs. One suggestion to reduce the high energy input necessary for distillation is to increase temperatures and pressures, with a plant to recover process heat and recycle it, cutting net energy consumption."

He reports that solar processes are encouraging, particularly in dry areas of high solar intensity. Of the known methods, solar distillation appears to offer the best and cheapest possibilities for producing fresh water from brine. High costs of initial equipment and maintenance, however, are still a barrier.

Membrane demineralization essentially consists of electrolysis through permeable or semi-permeable membrances. Positive salt ions migrate to one membrance, negative ions to the other, depleting water of its saline content. Fouling of membrances and reduction of membrance strength reduces efficiency sharply. This process is considered most applicable for treating brackish waters where initial dissolved salt content is less than 4,000 ppm. Osmotic membrance processes face the same problem of membrance durability during use.

Vickery concludes that "freezing processes present many attractive features, among them lessened scaling and corrosion because of the lower temperatures, and potential economy due to lower value of heat of fusion against heat of vaporization. Major problem here is separating crystallite ice from the brine mother liquor.

"Zone refining, widely used in the purification of high melting point metals, may also have applications in recovery of fresh water from salt water. Utilizing a frozen zone, instead of a molten one, this method shows considerable promise, based on its efficiency in preparation of heavy water.

"Solvent extraction of fresh water is technically possible, providing the extracting liquid can absorb large quantities of water, retain its identity and be nearly insoluble in water. This process, because it would involve little change in temperature, is potentially cheapest of all, but low cost water production depends on obtaining a superior solvent and a satisfactory method of solvent recovery. Attention is now being focused on substituted amines and clycol-ethers, the latter being preferred because of their greater chemical inertness in sea water."

Stethoscope Aids Engine Mechanics

The medical stethoscope now helps mechanics diagnose engine troubles, determine leaks in piping and defects in compressors, pumps, vacuum systems and gear sets, reports *Fleet Owner*. The stethoscope picks up the sounds of the equipment to be diagnosed. By turning an adjustment screw on the stethoscope handle, some sounds will be amplified, while others are suppressed.

Engineer Cast in Many Roles

Modern engineering problems are such that the engineer must now also be a diplomat, salesman, economist and long-range planner, the American Society of Civil Engineers was told Feb. 25 at its convention in Chicago.

On the convention program to present a report on Chicago's Calumet-Sag Navigation Project, Colonel John B. W. Corey, Jr., an U. S. Army engineer attached to the Army Engineering District of Chicago, told his audience:

"The problems encountered in this project are typical of those encountered in modern engineering in which the trend seems to minimize technical aspects and place greater emphasis on non-technical considerations which must be resolved to satisfy various interests.

"The role of the engineer has been expanded and now he must be a diplomat, salesman, economist and long-range planner.

"These additional responsibilities must be assumed by engineers in order that technical aspects are not disregarded and, most importantly, who more logically should undertake them?"

Discussing the various engineering problems related to the Cal-Sag project, he said that all railroad bridges crossing the channel must be reconstructed. This portion of the project, he said, accounts for 55 per cent of the federal cost of the first part of the project.

"Relocation of the railroads in the vicinity of Blue Island is perhaps the most complex engineering problem being encountered," Colonel Corey revealed.

"Due to the fact that four railroads converge on the Blue Island area, as well as major highways, and cross the channel which is to be widened and straightened at this point, considerable discussion was necessary to explain and illustrate the proposed changes to the affected interests."

To meet this problem, he said, a model was considered the best solution and one was built.

"The decision proved to be a wise one because many aspects of the work were explained and worked out more expeditiously than would have been possible otherwise."

He said the major highway bridge involved is at Western avenue in Blue Island. Planning for the replacement of this bridge must proceed without delay, he added, since it is an important factor in the resolution of highway traffic problems at Blue Island.

When completed, he stated, the first part of the Cal-Sag project will provide an adequate through waterway between the Illinois Waterway system and Lake Michigan.

Modern barge tows presently operating on the inland waterways will then be able to serve Lake Calumet and the Calumet River industrial area, he added, thereby providing the advantage of low cost transportation of bulk commodities. Extensive areas are thus made available for development as industrial sites along the route.

"Already some facilities are in operation and others are in the planning stage," he commented. "These developments confirm the forecasts which were presented in justification of the improvement."

Electrical Paper

High-strength paper that conducts electricity now is being produced experimentally, reports *Product Engineering*. The fibers are metal filaments instead of wood, or combinations of metal, glass and synthetic fibers.

Ten West Germans To Take Field Trip

A ten-man German team composed of members of the West Germany Screw Machine Products Association, plus their executive director, will visit the United States on a special field trip beginning April 26.

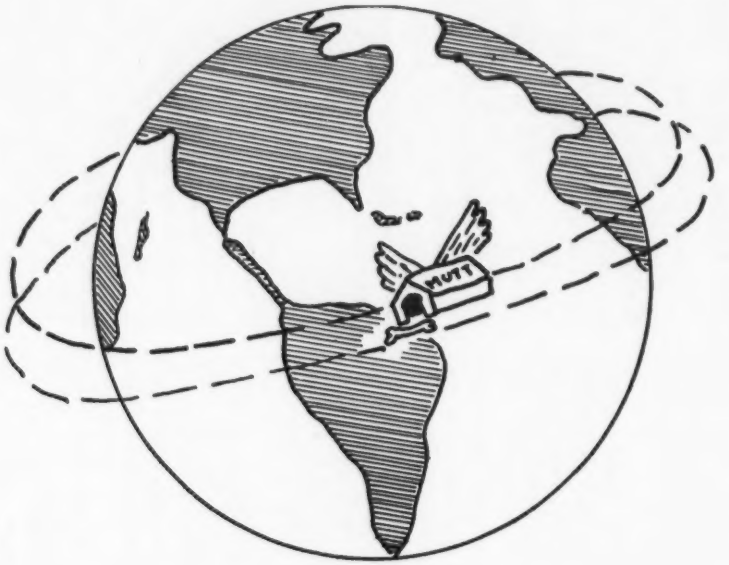
The group, which is comparable to this country's National Screw Machine Products Association, will study American screw machine products production techniques, and the roll of NSMPA in relation to its member companies.

The team will land in New York, then journey to Washington to visit the U. S. Department of Commerce and the offices of the American Society of Association Executives.

From there, the group will travel to Chicago to attend the 25th anniversary meeting of the National Screw Machine Products Association. It will also visit screw machine product producers in the Chicago area.

During its stay in this country, the German group will visit machine tool builders and basic metal producing plants in both eastern and western states.

Last summer, the West Germany Screw Machine Products Association was host to a NSMPA-sponsored trip to its country.



Results of Membership Drive
June 1, 1957 - March 7, 1958

511 Proposal cards were sent in

121 Members sent in proposal cards

109 Applications for membership were received

Population to Triple in Century

One hundred years from today there will be three times as many people as there are now. With this population increase, annual world energy demand will go up between 10 and 100 times.

Fossil fuel production (coal, oil, gas) in the United States will fall short of demand within ten to thirty years.

These predictions place an "urgent" stamp on development of new sources and methods of creating electrical energy.

According to Dr. Morris A. Steinberg, head of the metallurgy department of Horizons Incorporated, Cleveland process and materials research organization, "the whole problem revolves around the highly inefficient way we produce electrical energy today. A turbine, powered either by steam or water, spins a generator which produces electricity. By the time the electrical flow reaches a transmission line, its delivered kilowatt load is only about 30 per cent of what the original fuel material could have delivered.

"If we could bring this efficiency level up to 60 to 80 per cent," he points out, "that is, get two to three times the amount of energy out of the same piece of coal, our fossil fuel resources would last a great deal longer."

Science today is carefully examining the possibilities of direct generation of electricity, creating current without the use of moving parts.

Steinberg notes that "two major areas of study are under investigation. It may be possible, for example, to use solar or nuclear power sources for direct generation of electrical energy. But generating electricity in electro-chemical cells is more immediately promising."

In its simplest terms, an electrochemical fuel cell is a device for converting chemical energy into electrical energy. The fuel used depends on the method of approach: coal, oil or gas hydrogen are all possibilities.

One fuel cell, using a reaction of hydrogen and oxygen is now in limited use on special applications.

"This cell is similar to a battery, except that it has porous electrodes and does not degrade. In operation, hydrogen is diffused through the positive electrode, reacting with hydroxyl ions, formed in the electrolyte by diffusion of oxygen through the negative electrode. The overall reaction is the formation of water plus two electrons.

The theoretical voltage of this reaction is 1.01 volts, based on the chemistry for water formation by this reaction. The total amperage obtained is a function of the number of electrodes and their area.

Horizons' metallurgy chief states, "it is interesting to note that these cells can be run in series with multiple electrodes so that high power outputs can be obtained. And, of great importance, life expectancy of the cell is unlimited; neither electrolyte nor electrodes are consumed during operation.

Despite the many obvious advantages for such power generation, several problems do remain before these devices can come into popular use.

"From a practical point of view, the biggest problem is cost. This stems primarily from the lack of low cost hydrogen, which obviously can be solved when hydrogen, at a reduced price, becomes available.

"Then, too, no one can yet predict that fuel cells will be used as a power source for public utilities. A fuel cell produces direct current. Most homes and commercial establishments now use alternating current. Accordingly, converting direct current into alternating current results in the same loss in efficiency, bringing the same old problem back into focus again."

Steinberg concludes, "nevertheless, there are strong indications that within a few years, fuel cells will be in common use on special purpose applications, particularly where silent, portable power sources are required."

Automative Control Course is Announced

The University of Michigan, College of Engineering, has announced a summer Intensive Course in Automative Control scheduled for June 16 to 25, 1958, inclusive. The course is intended for engineers who wish to obtain a basic understanding of the field, but who cannot spare more than a few days for this purpose. The aim of the course is to make the subject matter easy to learn by a coherent presentation in class of the fundamentals of modern automatic control, and by providing a comprehensive set of notes which will serve as a framework for further study.

The course is built around the principles and application of measurement, communication and control. The material will begin with the fundamentals in each of these fields and will include some basic work in nonlinear systems. This will be followed by applications of the fundamentals to more advanced problems. There will be four hours of lecture each morning and three hours of laboratory demonstration in the afternoon. Extensive use will be made of computing, instrumentation, and servo laboratories on the campus. The role of analog computing methods will be emphasized.

April 15 is the closing date for registration. Further information may be obtained by writing to Professor L. L. Rauch, Room 1525 B, East Engineering Building, University of Michigan, Ann Arbor, Michigan.

New Products

As described by their Manufacturers

Langley Manufacturing Co., Cambridge 41, Mass. has just announced a new low-priced utility hydraulic lift selling for $195.00, f.o.b. Cambridge.

"Little Dickie," Model FPD is a mobile, compact, foot-operated hydraulic lift and transport truck designed for all lifting and positioning jobs up to a maximum weight of 750 lbs. and a maximum reach of 65" off floor.

Maximum lift is derived from minimum foot effort. Operator's hands remain safely free. Hydraulic lift system absorbs recoil and prevents sudden failure. Caster steering assures good maneuverability and stability.

Little Dickie has been especially designed for departments or operations too small for usual power lifting equipment. Write Langley Manufacturing Company, 920 Cambridge Street, Cambridge 41, Massachusetts, for complete data.

* * *

A new, small, lightweight, but powerful motor, designed for use in such intermittent duty applications as adding machines, calculators, check protectors, check signers and actuators, has been announced by the Bodine Electric Company, 2254 W. Ohio St., Chicago 12, Ill.

The new Bodine Type FSE-23 motor, designed for economical, high volume production, is representative of the quality workmanship that is characteristic of all Bodine motors. It is series wound, self ventilated, 1/40 hp, has a nominal speed of 5000 rpm and runs in a single direction — either clock or counter clock.

A height of 2 5/16 inches and a convenient, rectangular shape permits the FSE-23 to be mounted in a minimum amount of space. Has a natural die cast aluminum finish.

* * *

A new line of standard polyethylene tanks has just been announced by the American Agile Corporation, Maple Heights (Cleveland), Ohio.

All tanks are self-supporting, light in weight, chemically inert, non-contaminating, and are engineered for long, trouble-free service.

The line is composed of three basic types. Cylindrical, self-supporting tanks, 22-⅝" O.D., 22" I.D., 34" deep, ½" thick bottom, with 55-gallon capacity; square, self-supporting tanks with 25-gallon capacity, 18" x 18" x 18" I.D., ½" thick wall throughout; and retangular, self-supporting tanks, 20" x 12" x 20" deep, I.D., ½" thick wall throughout.

Where required, tanks can be supplied with mixing and stirring equipment, outlets, covers, sight glasses, overflows and similar fittings.

Additional information may be obtained from the American Agile Coporation, P. O. Box 168, Bedford, Ohio.

* * *

A new pressure transducer, designated SMI Type TR 719, converts an AC excitation to a DC output signal that is proportional to differential or absolute pressure.

The unit has been designated for use in telemetering pressures such as aerodynamic, power plant or hydraulic systems. However, it can also be employed in many other applications such as the sensor in a DC feed back loop. It is ideally suited for high accuracy and high environmental missile requirements where common potentiometer transducers exhibit excessive friction, resolution and unreliability.

The unit operates in the ranges from 15 to 3,000 PSI and its rugged design allows accurate and reliable operation under relatively high shock, vibration and accelerations. For example, a 300 PSI unit will exhibit less than 0.2% error when subjected to 15 g's vibration and 10 g's acceleration and can withstand 20 g's shock without appreciable reset.

Servomechanisms, Inc. is a leading designer and manufacturer of complex electromechanical control and instrumentation equipment and components primarily used in aircraft and missiles.

For additional information contact Servomechanisms, Inc., Subsystems Division, 12500 Aviation Boulevard, Hawthorne, California, Attention: Customer Liaison Department.

* * *

"Clik-Stop," the automatic wrench with the golden knurl-, that's the name of a revolutionary new tool currently announced by the Proto Tool Company of Los Angeles. The new wrench is the first automatic "adjustable." It requires no adjustment other than simply turning the knurl as in the case of an ordinary adjustable wrench. There are no gadgets, no levers, no buttons. As the knurl is turned, jaw openings are held fast, and can't change position.

The wrench has been developed and perfected after years of research, and is the happy answer for the tool user who wants quick effortless settings that stay in position regardless of how often the jaw opening is used on a particular size nut or fitting.

Proto's new "Clip-Stop" Golden Knurl wrench is available now in the five most popular sizes, 4", 6", 8", 10", and 12". The tool is of fine quality, a precision-made product forged from fine alloy steel. Each wrench is highly polished and then chrome plated to pre-

vent rust and enhance appearance. Absence of a corner lip on the movable jaw (in most sizes) allows a square nut to fit flat to the inside jaw surface. Better adaptability to different size nuts, including Metric & Whitworth, and elimination of "knuckle-busting" due to slippage results from precision non-slip adjustment. Every handle uses a husky I-beam construction and has a hole for convenient hanging.

The wrench has been intensively tested both in the laboratory and in the field. In one gruelling usage test, the knurl was turned for a total of almost 2 million clik-stop positions, with no appreciable signs of wear. It has been literally built to last a lifetime.

The wrench is now on sale at almost all outlets that sell tools, and is valuable for both professional and home use.

For further details, write Dept. JPN, Proto Tool Company, 2209 Santa Fe, Los Angeles, Calif.

* * *

What is called the most significant advance in a quarter century of caliper design is announced by the George Scherr Company. Their new Lustro-Chrome Stainless Steel Vernier Caliper, they say, takes the glare out of caliper readings, a vital aid for measuring instantaneously and accurately in 1/1000ths of an inch, even under poor lighting.

A radically new raised edge design was created to give full and lasting protection to the dull chromed surface—the raised edges acting as a guideway for the vernier scale.

For extra easy reading, a double length vernier has been added. Stainless steel makes the tool rustproof against atmospheric conditions and perspiring hands. By a new technique, jaws as well as beam are fully hardened throughout for long life.

Their Toolmakers Vernier Caliper has extra long jaws and sensitive fine adjustment screw and is available with 8″, 10″ and 12″ measuring capacity. The Shop Vernier Caliper is designed for measuring of outside, inside and depth dimensions with a measuring capacity of 5-5/16″. The cross horns permit measuring the diameter of the smallest holes and distances between them. Die and gagemakers will appreciate the convenience of converting inside to outside dimensions; also to measure the depths of cavities, countersinks, keyways, slots etc. The graduations on both models are 1/1000″ on lower scale and 1/128″ on upper scale.

These significant features of the new "Lustro-Chrome" Vernier Caliper represent a revolutionary advance in design, construction and usefulness. Fully illustrated pamphlet showing the "Lustro-Chrome" Vernier Caliper in all details can be obtained from George Scherr Co., Inc., 200 Lafayette St., New York 12, N.Y.

* * *

Wayne Kerr announces the availability of a new Video Oscillator Type O-22C, which is a thermistor bridge stabilized L-C oscillator covering the frequency band 10 kc to 10 Mc in six ranges.

The accuracy of calibration is 1%, and the frequency is independent of load impedance. The total harmonic content of the output waveform is less than 1%. The amplitude remains constant to within ± ½ dB throughout the frequency range and is independent of variations in supply voltage and range setting. This feature not only avoids the necessity of resetting the reference level, but also provides a means of measuring the load impedance by the reading on the output voltmeter. A common source of error in gain and attenuation measurements arises from mismatch between the generator and the load. If, however the internal emf and the impedance of the generator are fixed, the voltage across the load is a measure of its impedance. The monitoring voltmeter is therefore calibrated to read the local impedance directly.

The reference level of the oscillator is 1V p-p and a constant resistance attenuator provides a control of output between −50 dB and +10 dB in steps of ½dB. The output impedance is 75 ohms. An additional "High Level" output socket is provided so that the oscillator may be used as a variable frequency source for bridge measurement. The voltage obtainable from this socket is 2V r.m.s., provided the load impedance is not less than 10,000 ohms.

Further information on the new Wayne Kerr Video Oscillator Type O-22C is available from Wayne Kerr Instruments, P. O. Box 801, Philadelphia 5, Pennsylvania.

* * *

An all new construction industrial leakproof battery is being marketed by Bright Star Industries.

The new battery, designated No. 10MC Leakproof, is designed to give performance that will exceed National Bureau of Standards C-18 Specifications for Heavy Intermittent Test by 20%. 10MC Leakproof features a steel reinforced top and bottom with double steel locked outer seal, which ensures maximum protection against leakage. The use of double Polyethylene plastic film barriers for side insulation, a novel Bright Star feature, prevents power dissipation as well as leakage. The jacket of the new battery is electrolyte resistant and fully insulated against short circuiting.

Other important features are extra long fibrous graft retaining walls and a solid brass cap for assured conductivity.

Samples and performance data sheets for industrial consumers or distributors are available from Bright Star Industries, 600 Getty Avenue, Clifton, N. J.

ENGINEER

"EJC's Report on What's Happening in Engineering"

ENGINEERS JOINT COUNCIL • 29 W. 39th STREET, NEW YORK 18, N. Y.

Vol. III, No. 1

Jan.-Feb., 1958

"LOOK AHEAD"— From inaugural speech by EJC President Enoch R. Needles: ". . . The most productive future of EJC lies ahead. . . . Its principles have gained the support of fifteen engineering organizations, representing some 250,000 individual engineers. This evidence of approval is truly and completely impressive. . . . One of the finest conceivable developments has been the spirit of unanimous approval which appears undeniably evident in all of our societies toward our new United Engineering Center to be constructed adjacent to United Nations Plaza. . . . The challenges before us in the coming year are without precedent. Of continuing interest is our endeavor toward complete unity in EJC on the part of all our major engineering organizations." (Mr. Needles' comments on the international situation, quoted in press and radio, made these points): "To ascribe the Russian rocket and satellite lead to weakness in American technology is misleading and erroneous. . . . We have not lost our technological leadership or engineering productivity, but we must push everlastingly forward in our educational processes for engineers and scientists and in the orderly and intelligent administration of their endeavors and services. . . . The first step the country must take is to provide adequate administration and direction for the technological team of scientists and engineers which exists. There is no reason why the U.S. cannot have, at one and the same time, a continuing rise in the living standard and a defense capacity of ever-increasing strength."

UPCOMING MEETINGS —

EJC Regional Meeting — First regional EJC meeting — scheduled for May 19 at Chicago's Sherman Hotel. Sponsored with cooperation of local sections of national societies and the Western Soc. of Engineers (EJC affiliate in area). Theme — The Next Decade in Engineering. Watch Engineer for program details.

INTERNATIONAL RELATIONS — Chairman G. A. Hathaway of the Committee on International Relations, in a written report to the President of EJC, indicated extension of EJC's quest for unity in the engineering profession by assisting in organizing a Federation of Engineering Societies among nations of the Pacific and Far East. Such a federation, of which EJC would be a member, tentatively includes United Technological Organization (Philippines), Institution of Engineers (India), Japanese Federation of Engineering Societies, Institute of Engineers (Pakistan), Institution of Engineers (Australia), Council of New Zealand Inst. of Engineers and Assn. of Engineers (Burma). These recommendations by EJC's CIR antedates federal intent in this area and on Jan. 9, 1958, this CIR recommendation was approved by EJC's Board:

> "believing that the furtherance of world peace depends upon the cooperation of professional groups of all countries, it is recommended that EJC confirm its interest by requesting the Committee on International Relations to make a further unofficial survey upon which to base a definite recommendation on the formation of a Federation of Engineering Societies of the Pacific and Far East areas."

WATCH FOR — EJC Policy Statements on education for national security and — at least equally important — policy recommendations to end gross misuse of engineering manpower through outmoded government manpower policies.

River Boat Fleet is Completed

United States Steel Corporation's current program to expand and modernize its fleet of river boats was completed Feb. 6 with the christening of the last of three diesel-powered boats at St. Louis. The craft was scheduled to start its river trip to Pittsburgh a few days later.

At afternoon ceremonies, the 120-foot long craft was christened the *S. M. Jenks,* after Stephen M. Jenks, assistant executive vice-president of operations, of U. S. Steel. She was built by the St. Louis Shipbuilding and Steel Company, as were the other two boats—the *H. B. Jordan* and the *USS I* — which were placed in service during the past few months.

All three of the vessels are unique in that each has a hull made entirely of stainless steel. This marks the first time, officials of the shipbuilding company said, that this corrosion-resistant steel has been used in hull construction of inland waterway work crafts.

The *Jenks* will move cargo barges on the Ohio and Monongahela rivers, with her base at U. S. Steel's Clairton Works at Pittsburgh. Her hull measures nine feet in depth with a 27-foot beam and a draft of 6½ feet.

The new towboat, sister to the *H. B. Jordan,* rounds out U. S. Steel's current program to expand a river fleet which started with a single wooden towboat and two barges 38 years ago. The fleet now handles annually over 12,000,000 tons of cargo, 98 per cent of which is coal.

Approximately 40 tons of stainless steel hull plating was used in construction of the vessel, welded by 3,000 pounds of stainless steel rods. Nearly eight tons of stainless steel forgings and castings were used. The scow bow is stainless as well as the stern tubes and struts. The two 4-blade, 80-inch diameter propellers also are stainless steel, as are the propeller shafts. The rudders, as well as the two inboard sea-chest compartments, likewise, are of stainless steel.

Both Mr. and Mrs. Jenks, along with their daughter, Nancy Kay, age 15, participated in the christening ceremonies, held Feb. 7 at the Market Street dock in St. Louis. Hosts for the occasion were H. T. Pott, chairman of the board, and Arthur Parsons, president, both of the St. Louis Shipbuilding and Steel Company.

Other U. S. Steel officials present included E. H. Gott, vice-president-operations-steel, R. C. Moffitt, vice-president-purchases, and their wives; Loring S. Brock, sales manager-structural and plate products; Captain George T. Griffiths, division superintendent of river transportation, Clairton Works, and Fred Dudderar, assistant general superintendent, Clairton Works.

Also present were Mrs. Katherine Griffiths, of Pittsburgh, and Mr. and Mrs. Eskil T. Eskilson, of Gary, Indiana.

The towing vessel is powered by two Fairbanks-Morse opposed-piston diesel engines each developing 640 hp at 720 rpm. Her reversing gears will enable the engines to continue running in one direction while the boat is backing, thus eliminating the need of stopping the engines to reverse their direction.

Air-conditioned quarters for the 13-man crew consist of seven cabins. Appointments are modern in every respect. Cooking and drinking water will be stored in two 1500-gallon capacity, stainless steel lined tanks. Radar and radio systems are installed as navigational aids. All main engine controls will be at the pilot's fingertips through use of a Westinghouse air brake pilot house remote control system.

U. S. Steel's fleet hauls coal from river mines to Clairton Works, where 1500 ovens convert the coal into coke, one of the basic ingredients in steelmaking. Gases given off during the process are made into coal chemicals, used as a base to make plastics, dyes, paints and pharmaceuticals. With the addition of the *Jenks,* there will be four steamers and five diesel vessels in this service.

The St. Louis Shipbuilding and Steel Company was founded in 1933. Construction of the *Jenks* represents the 1,621st hull and the 157th towboat designed and built by this company.

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C-6757 HYDRAULIC & SANITARY ENGRS. (A) Grad. HYDRAULIC ENGR. age 30-42; 5+ yrs. exper. in flood control, will assist in the prep. of tech. literature on dams, flood control, culvert & drainage structures. (B) Grad. **SANITARY ENGR.** age 28-35; 3+ yrs. in sanitary engrg. will assist in the prep. of tech. literature on sanitary, water & sewage plant, both positions involve inspection of project under construction & assisting field force in promoting use of concrete for projects. Must have good personality & ability to speak in public, travel, sal. open loc. Chgo. employer will pay the fee.

C-6763 SOILS ENGR. Grad. CE with soil option 3+ yrs. exper. in soils mechanics. Duties: Initial assignment 3 to 4 mos. making survey study of soil conditions in Israel; then in Chgo. as member of staff on soil problems for a consultant loc. Hdqrs. Chgo. employer will pay the fee.

C-6764 DEVELOPMENT ENGR. BS or MS age 25-35; 2-3 yrs. design, eqpt. mech. working of metal exper. desirable but not required. Duties: Mech., metallurgical devel. work, new process design, devel. of new eqpt. for mech. working of metal sal. $550-750 loc. Calumet Area, employer will pay the fee.

C-6767 SUPT. OF MAINT. & ADMIN. ENGR. Grad. Engr. age to 50. Duties: To take complete charge of staff of 75 maint. people on all mech., elect. & janitorial facilities. Must be good administrator & coordinator for a large loop bldg. operation sal. $10,000+ loc. Chgo. employer will pay the fee.

C-6769 SALES ENGR. CE age 30+; 3+ yrs. in construction design or sales. Duties: Selling ready mix concrete & concrete products to contractors & builders. Contact architects & engrs. to include material in their specs. Base sal. of abt. $500 & expenses for 1st yr. thereafter on incentive & contract plan, potential $10,000 car furnished loc. Chgo. employer will pay the fee.

C-6770 DRAFTSMAN MECH. ME age 28+; 3+ yrs. drafting on high speed automatic mach'y. know paper-converting & coating machinery design for a mfgr. of paper products sal. $5-600 loc. Chgo. employer will pay the fee.

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C-6772 DESIGN & SPEC. WRITER ME 5+ yrs. exper. in consultant or engrg. office on mech. facilities, htg., vent., plbg., air cond., etc. Must be able to work on own with minimum amt. of supervision for a consultant sal. up to $750, loc. Chgo. employer will pay the fee.

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873-MW GEN. MGR. V.P. MFG., MGR. OF MFG. 39 BSME MAB Exper. from mach. operator to top mgmt. in mfg., labor relations, all phases of industrial engrg. & cost controls.

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Utilities Use Most Advanced Equipment

In their efforts to hold the line on the cost of producing electricity, public utilities are bringing the most advanced power station equipment into use promptly. Illustrating that fact was a recent report by The Babcock & Wilcox Company that it has been awarded a contract by the Southern California Edison Company to build a "once-through" type of steam generator designed for operation with variable pressure.

Under terms of the contract, B&W will provide the steam generator—known as a "Universal Pressure" unit—for Southern California Edison's new station at Huntington Beach, Calif. The unit will provide 1,638,000 pounds of steam per hour to the throttle of a 200,000 kilowatt turbine at a pressure of 2400 pounds per square inch and a temperature of 1050 degrees F., and will reheat the steam to 1000 degrees F. Completion of the unit, which will burn either natural gas or oil, is scheduled for March, 1960.

The Universal Pressure boiler permits control of the turbine output by varying boiler steam pressure instead of throttling the pressure at the turbine, which leads to a "considerable" saving in heat, according to Babcock & Wilcox officials. For this reason, they said, the development is expected to be of high interest to the utility field, since it comes at a time when electrical producers are making a concerted attempt to minimize the effects of inflation on the cost of power.

In addition to its heat-conservation advantages, the Universal Pressure steam generator is expected to save utility companies money through the elimination of many components ordinarily required by conventional "drum-type" boilers of similar capacities, B&W sources said. Because it is more compact, weighs less, and is lower in height, it is expected that it will provide savings in power station construction, and that its simpler operation will make it more economical to maintain.

Cavitation Detector Uses New Discovery

A cavitation detector based on a newly discovered phenomenon in the cryogenic and hydrocarbon field has been produced by The Garrett Corporation's AiResearch Manufacturing Division in Phoenix, Arizona.

Cavitation or the formation of bubbles occurs when pressure at any point in a fluid flow system approaches the vapor pressure of that fluid.

Extremely small, the AiResearch detector indicates the existence as well as the location of cavitation in any complex flow system according to James Clark, AiResearch engineer in charge of the project.

Cavitation in missile oxidizer systems can result in explosions when the oxidizer-fuel ratio has been upset by bubbles in the system.

The detector determines any tendency of oxidizer and fuel systems of missiles to cavitate while undergoing development, in the test stand prior to flight, or in flight.

Another missile application is to detect cavitation when booster rocket oxidizer or fuel sources approach depletion and pressurizing gas enters the oxidizer or fuel systems. Maximum fuel usage with greater missile range can be assured as well as maintaining a balanced oxidizer-fuel ratio before booster rockets are released.

Gas detection by the AiResearch unit has been very exact. The detector has recorded bubbles 1/20 of an inch in diameter in a six inch line. Detection signals can be transmitted to an oscilloscope, a firing circuit such as a rocket booster ejection circuit, or a telemetering transmitter, etc.

Circuits can be calibrated for individual fluids such as water, liquid oxygen or hydrocarbons, etc. depending upon characteristics of the liquid.

The new detector also opens a new field in hydrodynamics and fluid flow problems according to AiResearch engineers. In addition to being a research tool it has important industrial applications for the control of fluid flow pumps and valves. Potential applications include marine and stationary boiler feed pumps and distillate pumps in petroleum refining operations.

Applications being accepted for position of

Director of Public Works

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Salary range: $8,000. to $10,500 per year. Address letter stating qualifications to Village Clerk, Village Hall, Lansing, Illinois.

Reviews of Technical Books

Network Synthesis

Network Synthesis, Volume I, by David F. Tuttle, Jr., John Wiley & Sons, Inc., New York 16, N.Y. 1958. Pages, 1175. Price, $23.50. This covers two-terminal networks.

Dr. Tuttle, professor of electrical engineering at Stanford University, is primarily concerned with the principles of synthesis of electric networks in which steady-state behavior as a function of frequency is all-important. Although theoretical in emphasis, the new book discusses practical phases of network theory, and points out the actual difficulties encountered in constructing networks.

The comprehensive survey sums up all important advances of the past 20 years. This, added to the classical material, is augmented further by occasional new proofs and points of view. Of particular note are the treatment of approximation, and the detailed discussion of potential analogy.

Working toward his chief aim—a clarification of how to synthesize or design networks—Dr. Tuttle goes through three logical steps. These tell how to obtain a working knowledge of network properties, investigate ways of approximating behavior which may be desired but which the results of step 1 indicate are not realizable, and carry out the actual synthesis (realization) of networks to attain these ends.

In Volume II of this two-volume work, Dr. Tuttle will concentrate on four-terminal networks.

Scientific Languages

Scientific French, by William N. Locke, John Wiley & Sons, Inc., New York 16, N.Y. 1957. Pages, 112. Price, $2.25. *Scientific German*, by George E. Condoyannis, John Wiley & Sons, Inc., New York 16, N.Y. 1957. Pages, 164. Price, $2.50. Both volumes are spiral bound.

These two foreign language grammars are concise and streamlined to promote an accurate reading ability of scientific and technical material.

No previous knowledge of French or German is required to work with these books, which provide succinct explanations of the structural elements of both languages. Grammatical terminology is explained as it is introduced, but kept to a minimum.

The translation of papers of normal difficulty is furthered by this realistic approach. Passages from contemporary technical German and French sources supply authentic threads through the maze of verbs, tenses, genders, and sentence structures. Although not a literary allusion creeps into these pages, the sound mature treatment paves the road to literary reading as well.

Encouraging, as they do, the recognition rather than formation of foreign phraseology, both grammars concentrate on the devices that will develop this facility. How to spot plurals, identify past participles, and untangle prefixes, and pointers on apprehending pronouns, adjectives, and interrogatives are among the many useful tips given. Applicable to all fields, the books are for everyone in science and technology, from student through Ph. D. candidate.

Dr. Locke is professor and head of the department of modern languages at the Massachusetts Institute of Technology. His book is based on material used at M. I. T. for six years and appeared in a test edition published by The Technology Press. Dr. Locke is also co-editor, with A. D. Booth, of *Machine Translation of Languages*, published in 1955.

Dr. Condoyannis is assistant professor of modern languages at Saint Peter's College. He was previously at M. I. T. for ten years, and has advocated modern methods of language teaching in an earlier book and many articles.

Queues and Inventories

Queues, Inventories and Maintenance, by Philip M. Morse, John Wiley & Sons, New York 16, N.Y. 1958. Pages, 202. Price, $6.50.

Queues, Inventories and Maintenance is the first in a new series entitled Publications in Operations Research, sponsored by the Operations Research Society of America and Wiley.

Subtitled "The Analysis of Operational Systems with Variable Demand and Supply," the new volume provides a general description of the subject, defines terms, and outlines some of the analytic aspects of the theory. Dr. Morse deals with the queuing problem from the standpoint of the Kolmogorov equations relating the probabilities, supplies a unified method for expressing various problems in terms of difference equations, and then gives various procedures for solving these equations. For the first time, a unified discussion of effect of changes of arrival and service distributions on queuing results is given.

The chapter headings contain: representation in terms of probabilities; probabilistic descriptions of arrivals and service times; single and multiple exponential channels; simulation of non-exponential distributions; general considerations, transient solutions; single and multiple channels, infinite queues; queue discipline and priorities; problems of inventory control; and maintenance of equipment.

Dr. Morse, who served as the first president of the Operations Research Society of America, is professor of physics at the Massachusetts Institute of Technology, and a co-author of various other books. These include *Methods of Operations Research* with G. E. Kimball, and *Spheroidal Wave Functions* with J. A. Stratton, L. J. Chu, J. D. C. Little, and F. J. Corbato, both published jointly by Wiley and The Technology Press of M. I. T.

The series inaugurated by this new volume is designed to provide comprehensive and authoritative studies of some of the basic theories, new concepts, and practical applications likely to be of general use in operations research.

New Buildings Open at Argonne

Two new apartment-motel-type buildings opened their doors the week of Feb. 3 at Argonne National Laboratory, Lemont, Ill., to house scientists and engineers from all over the free world.

It is the first apartment-motel-type housing to be situated on the 3,700 acre site of the nation's senior atomic energy research and development center.

Opening of the two buildings coincided with the start of the sixth session of the U.S. Atomic Energy Commission's International School of Nuclear Science and Engineering at Argonne, at which classes began Feb. 5. Foreign and American scientists attending the School have reserved these two buildings to 100 per cent of capacity.

The third building opened on March 1. It, too, was reserved to capacity by International School students and visiting scientists. Each year scores of scientists come to the Argonne atomic energy center to work and study.

There are 6 four-room units in each building. Each unit consists of one kitchenette-living room and three bedrooms, with double plumbing. The six units are so arranged that they may be rented in any combination of one to four rooms. All rooms have outside entrances so they may be isolated for individual occupancy.

Two buildings have one story; the third has an extra lower ground floor which contains a recreation-lounge area, laundry facilities, and will ultimately provide a small kitchen and dining room.

"Provision of this new facility is a matter of necessity rather than convenience," said J. H. McKinley, Argonne business manager. He said, "Commuting time from the Laboratory to downtown Chicago is at least an hour each way, and there are few temporary rental apartments available in the surrounding western suburbs. Even with the three new buildings, Argonne will not have enough space to house many of its visiting scientists."

Rentals of the guest rooms at Argonne will be maintained on par with similar accommodations in Chicago. The project is self-supporting from rental receipts.

Before completion of the three new buildings, Argonne had three small structures for housing distinguished visitors. One is a lodge with five double bedrooms, part of an estate which the laboratory took over when it moved to its present site in 1948. The others are two-bedroom cottages, each with kitchen and dining facilities.

Several Laboratory programs will insure almost continuous full occupation of the new guest facilities, according to McKinley. Two groups of International School students, numbering between 60 and 70 foreign and American scientists, spend a semester at the Laboratory each year.

Under research arrangements with several universities, faculty and students spend three months to a year at Argonne. Even with the new buildings, it will be necessary to find accommodations for many of these people outside the laboratory site. Because a new high energy particle accelerator was recently authorized for the laboratory, increasing numbers of scientists and engineers are expected to come to Argonne, McKinley said.

Another demand on housing in the Argonne area is for accommodations for employees temporarily assigned by private industry to the Laboratory for training. "It is believed that pressure for assignments of short terms in special fields may build up and the problems of housing will therefore increase," McKinley said.

The guest facility is located in a woodland setting. Parking areas are provided in the immediate vicinity of the new buildings, but no garages or car ports are provided. The new guest facility was authorized by the Atomic Energy Commission, and its construction cost was about $500,000.

All units are completely furnished. Linen service is provided and laundered by the laboratory. Kitchens are equipped with normal household utensils, and washers and dryers are provided for use by residents.

Argonne National Laboratory is located approximately 25 miles west of Chicago. It is a center for research in all phases of science relating to peaceful uses of atomic energy.

The Atomic Energy Commission's Chicago Operations Office is located on the Laboratory's site. Its staff includes more than 400 employees.

Student Group is Graduated by Trane

Another group of graduates from U. S. and Canadian colleges and universities have just completed The Trane Company specialized engineering program and received their sales assignments in the field, according to vice-president A. C. Menke.

Trane is a leading manufacturer of air conditioning, heating and ventilating equipment.

The students represented over 17 states and three Canadian provinces. Designed to bridge the gap between scholastic background and assignment in the field, the training program is conducted on a year around basis in the La Crosse home offices.

Trane, located in La Crosse, Wis., is now including in the post-graduate course men who will specialize in self-contained and residential air conditioning equipment sales. Nearly 500 men have now participated in the program since its inauguration.

News of Engineers

New chief engineers of Link-Belt Company's Pershing Road and Caldwell plants in Chicago were announced recently. Ralph C. McMillan, former assistant chief engineer of the Pershing Road plant, has been appointed chief engineer of that plant, and David A. Davis, MWSE, divisional engineer of the Pershing Road plant, has been appointed chief engineer of the Caldwell plant.

McMillan has been with the Pershing Road plant since 1927 when he spent his summer vacations working in the construction department. He joined the engineering department in 1939 and has supervised the design of coal preparation plants, power plants, foundries and many other bulk material handling and processing installations. He became divisional engineer in 1949 and assistant chief engineer in 1954. McMillan is a native of Chicago, attended Morgan Park high school and the University of Illinois, received his civil engineering degree from the University of Wyoming and took graduate work at the Illinois Institute of Technology. He is a member of Sigma Chi and of the American Society of Civil Engineers. McMillan succeeds Mr. Joseph J. Richard who will handle special engineering assignments for the company's executive office.

Davis began his career with the Pershing Road plant in 1929 in the engineering department, and has served in many capacities in that department. In 1952 he became the plant's boiler house divisional engineer and in 1954 he became the plant's divisional engineer in charge of the dryer division. Mr. Davis was born in Chicago and attended Englewood Evening High School, the University of Wyoming and the Illinois Institute of Technology. He is a member of Tau Beta Pi and the Western Society of Engineers. Davis succeeds Herbert E. Schrader, MWSE, who will serve as a consultant on engineering sales contracts and special development projects.

* * *

Six new trustees have been appointed to the board of trustees of Illinois Institute of Technology, Chicago, it was announced by Dr. John T. Rettaliata, MWSE, IIT president.

The new trustees are Bennett Archambault, president of Stewart-Warner Corp., Chicago; William F. Crawford, president of Edward Valves, Inc., East Chicago, Ind., a subsidiary of the Rockwell Manufacturing Co., Pittsburgh, Pa.; James E. Day, president of the Midwest Stock Exchange, Chicago; John L. Dole, president of The Dole Valve Co., Morton Grove, Ill., and Arthur J. Schmitt, president of Amphenol Electronics Corp., Chicago.

* * *

John J. Starr, retired vice president of the Robinson Clay Product Co. of Akron, Ohio, was guest of honor at the Akron Chamber of Commerce golden anniversary dinner recently.

Starr, 90, a well-known figure in the Clay Industry and a 65-year veteran of Robinson Clay, is one of the few remaining links with the Akron Chamber's early days. Starr served as one of its first secretaries.

Distinguished guests at the Chamber dinner represented business, civic, and governmental leaders. John S. Knight, editor and publisher of the Akron Beacon Journal and the Chicago Daily News, was the principal speaker.

* * *

Robert H. Harmeson was appointed head of the Peoria Research Laboratory of the Illinois State Water Survey, effective Feb. 1. He succeeded Dr. Max Suter, named principal engineer on special assignment to study ground-water conditions in northeastern Illinois.

Harmeson was formerly with the University of California and the Atomic Energy Commission at Los Alamos, N. Mex. Previously he was associated with the Illinois State Health Department and the civil engineering department of the University of Illinois.

He is a veteran of five years service overseas with the Corps of Engineers and Air Force. He holds a bachelor's degree in civil engineering and a master's degree in sanitary engineering, both from the University of Illinois.

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A. E. Williams, general sales manager of the Robinson Clay Product Co. of Akron, Ohio, has been elected to its Board of Directors.

Widely known in the Clay Industry, Williams has been associated with Robinson Clay since 1916. He served as sales representative in the firm's New York, N. Y., and Albany, N. Y. branches; resident manager of its Bloomfield, N. J., Toronto, Canada, and Indianapolis, Ind.,

branches; and sales manager of the Vitrified and Refractories Divisions, prior to his recent promotion to general sales manager.

One of the Clay Industry's most diversified firms, Robinson Clay also manufactures a wide selection of pottery, china, and glass, in addition to its complete line of vitrified clay products and refractories.

* * *

William Fuerst, MWSE, recently returned from a visit to Central America. Fuerst, an engineer with Soiltest, Inc., Chicago manufacturer of engineering test apparatus, visited his company's sales representatives in Guatemala, Costa Rica, Nicaragua, Panama, Honduras, and El Salvador.

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John C. Arntzen of Melrose Park, Illinois, and George W. Schlutius of St. Louis, Mo., were elected executive vice-presidents of Mississippi Valley Structural Steel Company. Arntzen served as plant manager of the Melrose Park plant and is succeeded by Richard A. Simonsen. The newly elected plant manager at St. Louis is A. O. Muehlenbrock, who succeeds Schlutius in that position. Simonsen was the contracting manager at the Melrose Park plant, and Muehlenbrock held a similar position at the St. Louis plant. The new contracting manager at Melrose Park is Fred P. Haas, and Marvin R. Boydstun was named the new contracting manager at St. Louis.

Officers continuing in their positions are J. Bruce Butler of St. Louis, chairman; and Einar T. Blix, MWSE, of Chicago, president.

* * *

Gerald M. Marks, MWSE, announced the formation of a new company, Lighting Associates, specializing in the field of illumination.

The organization will represent Electro Silv-A-King Corporation and the Art Metal Company, manufacturers of lighting equipment.

Robert Harmon and Wesley Whitchurch will be partners in the firm, and will have their offices at 53 West Jackson blvd. in Chicago.

Marks was graduated from the Electrical Engineering School of the University in Illinois in 1950. He specialized in the Illumination option. After graduation he was employed by the Jersey Central Power and Light Company as a lighting specialist and later was manager of the Lighting Department of Electric Supply Corporation. He is a member of the Illuminating Engineering Society, besides the Western Society of Engineers, and of the American Institute of the Electrical Engineers. He is currently secretary of the Chicago Chapter of the Illinois Society of Professional Engineers.

Robert Harmon has had wide experience in the electrical field, having been associated with Harmon Electric Company, and Revere Manufacturing Company before joining Mr. Marks. He is a former president of the "Little Wheels" and is currently on the board of the Electric Golf Club.

Wesley Whitchurch's most recent association was as district manager with the Miller Company. Prior to that, he was associated with the General Electric Company in the Lamp Department.

* * *

Frank W. Edwards, MWSE, takes over as president of the Illinois Society of Professional Engineers on April 12 at the end of the 73rd Annual Meeting of that Society being held in Decatur, Ill.

Edwards joined ISPE as a National member in 1949. In 1951 and 1952 he was representative to the Illinois Engineering Council. He was elected Chicago Chapter vice-president (1951), President (1952), and afterwards became a representative of the Chicago Chapter to the State Board of Direction. Edwards has served as vice-president of ISPE during the past year. He is on the Board of Direction of the Western Society of Engineers, and has served as president of the Illinois Section of the American Society of Civil Engineers. He is also a member of the American Society of Mechanical Engineers and the American Society for Engineering Education. Edwards was head of the School of Civil Engineering at IIT until a few years ago when he became manager of the Chicago Office of the Stanley Engineering Company with offices at 208 South LaSalle St.

Donald S. Magowan, who becomes ISPE vice-president, has been a member of ISPE since 1945. He has been district engineer for the Illinois Division of Highways (District One) since 1955.

James P. Murphy, the new secretary-treasurer of ISPE, is a partner in the firm of Crawford, Murphy and Tilly, consulting engineers, in Springfield, Ill.

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The Instrument Society of America has announced the appointment of a Director of Section Activities to its National Headquarters in Pittsburgh.

Ralph M. Stotsenburg, of Moorestown, N. J., has assumed this position under the supervision of ISA Executive Director William H. Kushnick.

The Instrument Society of America is the technical organization of over ten thousand engineers, designers, consultants, technicians, and managers engaged in the manufacture, application, and use of industrial instruments and controls. The membership is organized into 90 sections throughout the United States and Canada.

Stotsenburg, formerly sales manager of the Instrument Division, Robertshaw Fulton Controls Co., goes to ISA Headquarters from the Philadelphia Section and from the position of chairman of the society's Sections and Membership Committee. He was also employed in a variety of sales and management positions by the Radio Corporation of America. He is a graduate of the Wharton School of Economics in Philadelphia.

WSE Applications

In accordance with Article I, Section 5 of the By-Laws of the Western Society of Engineers, there is published below a list of applicants for admission received since the last issue of the MIDWEST ENGINEER magazine.

Ralph Masek, 1009 S. 22nd Av., Bellwood, Ill., attending University of Illinois.

James D. Kirby, Owner, Associated Engineering, 3820 W. 63rd St.

Jack E. Miller, President, The Ellington Miller Co., 25 E. Jackson.

Roy Layman, Structural Engr., DeLeuw, Cather & Co., 150 N. Wacker Dr.

Edward O'Malley, Village Engr. & Bldg. Commissioner, Village of LaGrange, 53 W. LaGrange Rd., LaGrange, Ill.

V. V. Holmberg, Vice President, The Ellington Miller Co., 25 E. Jackson Blvd.

John P. Schrader, Plant Engineer, Illinois Bell Telephone Co., 215 W. Randolph St.

George H. Ember, Chief Elect. Engr., Marquette Cement Manufacturing Co., 20 N. Wacker Dr.

George Grohwin, Assist., Raymond Concrete Pile Co., 111 W. Monroe St.

Malcolm R. Sproul (Rein.), Staff & Personnel Engr., Illinois Bell Telephone Co., 208 W. Washington St.

George W. Blomme, Traffic Engr., DeLeuw, Cather & Co., 150 N. Wacker Dr.

Jeremiah P. Holland, Commissioner, Community Conservation Board of Chicago, 320 N. Clark St.

Timothy Melnick, (Rein.), Tool Design Engr., Hotpoint Company, 1554 S. 54th Av.

Robert F. Gallagher, Civil Engr., Central Steel & Wire Co., 3000 W. 51st St.

Albert L. Forde, Asso. City Traf. Engr., Bur. of Street Traf., City of Chicago, 320 N. LaSalle St.

Thomas G. Cots, Highway Engr. V, Cook County Highway Dept., 130 N. Wells St.

Richard J. Hogan, Sales Engr., Granco Steel Products Co., 307 N. Michigan Ave.

H. A. Elwell, Princ. Staff Engineer, Standard Oil Co., 910 S. Michigan Ave.

Hekmat Hakimian, Draftsman, DeLeuw, Cather & Co., 150 N. Wacker Dr.

Jon O. Nelson, 1203 Sunset Rd., Wheaton, Ill., attending Purdue Univ.

Robert L. Zralek, Traffic Engr., Bur. of Street Traf., City of Chicago, 320 N. LaSalle St.

A. L. Dierstein, Dist. Traf. Engr., Illinois Division of Highways, home: 526 Marcy St., Ottawa, Ill.

AIEE Will Meet At Michigan State

Michigan State University Campus will be the site of the comprehensive Great Lakes District Meeting of the American Institute of Electrical Engineers to be held in Lansing, Mich. May 5-7.

Topics, ranging from guided missiles, nuclear energy and science in Russia to problems involved in automobile lighting and railroad communications will be covered by some of the nation's leading engineers, scientists, industrialists and educators at the Kellogg Center for Continuing Education on the Campus. Joseph A. Stelzoff, professor of electrical engineering at MSU, will serve as meeting chairman.

AIEE is the world's largest engineering society with a membership of more than 50,000. The Great Lakes District includes the States of North Dakota. South Dakota, Minnesota, Iowa, Illinois, Indiana, Wisconsin and Michigan.

Presentation of technical papers will commence at 9 a.m. on Monday, May 5. At 7:30 p.m., the General Session will begin with J. H. Foote, president and chief engineer of Commonwealth Associates, Jackson, Mich. and vice-president of the Great Lakes District, presiding. Dr. John D. Ryder, dean, College of Engineering, Michigan State University, will deliver the principal address, "Missiles and Manpower." Walter J. Barrett, national president of AIEE, will address the session on problems facing the engineering profession and the Institute.

A report on "A Scientific Tour of Soviet Russia" will be presented by Dr. W. Crawford Dunlap, Jr. of Bendix Research Laboratories, Detroit, Mich., at a luncheon on Monday, May 5.

The latest nuclear developments will be discussed in a six-paper session on Wednesday, May 7 at 9 a.m. Problems involved in training engineers and the opportunities they may expect to find in industry will be considered in an education session on Monday, May 5 at 2 p.m.

Sessions on power transmission and distribution, communications, industry, electrochemistry, substations and equipment, electronics, automotive auxiliaries, industrial applications of electricity, electronic computers and the basic sciences will round out the technical program totaling 63 presentations.

A special college student program consisting of technical paper competition among members of AIEE student branches in the Great Lakes District will be held May 5th. Prizes for the winning papers and presentations will be awarded at a student luncheon on the following day.

As a supplement to the technical program, inspection trips to station WJIM-TV and the Oldsmobile Division of General Motors both in Lansing, have been planned. A program for ladies accompanying their husbands to the meeting has also been scheduled.

Russian Journal to be Translated

A leading Russian technical journal will soon be translated into English on a regular basis by The American Society of Mechanical Engineers, it was announced Feb. 17. The effort marks the first time that the engineering society has undertaken such a project.

Under a $35,000 grant from the National Science Foundation ASME will publish the bi-monthly *Journal of Applied Mathematics and Mechanics.*

The announcement noted that the Society had undertaken the task of translation "in an attempt to correct the present situation in which the Russians are familiar with the content of most, if not all, of our technical publications, while only a few of theirs are translated for use by the English-speaking world."

Arrangements have been made with Russian scientists, said an ASME spokesman, to secure proof sheets of the Russian journal in advance of final printing. This will permit speedier translation.

In the Russian language the magazine is know as *Prikladnaya Mathematika i Mekhanika*, abbreviated as *PMM.*

The magazine contains the latest theoretical and practical advances made by Russian scientists in mathematics, fluid dynamics and solid state physics. Copies will be sold, on a subscription basis, to any interested persons or groups at an annual rate of $35 for the six issues. ASME members are entitled to a 20 per cent discount. Subscriptions may be ordered from the Order Department, The American Society of Mechanical Engineers, 29 West 39th Street, New York 18, New York.

In a statement accompanying the announcement, James N. Landis, ASME president said, "Translation of the Russian publication *Journal of Applied Mathematics and Mechanics*, one of the leading publications of its kind anywhere in the world, is expected to make important technical contributions to the English-speaking world. It will provide many English-speaking engineers and scientists with access to the latest U.S.S.R. developments in a truly fundamental field. It is a service in which The American Society of Mechanical Engineers is happy to take part.

"In addition to making information available, however, the very initiation of such a project is a valuable contribution in itself. It serves to underline the universal nature of science and engineering, and to emphasize that in these fields there are no natural boundaries between nations. It is my hope that this project, together with the benefits that are sure to follow, will help to break down some of the artificial barriers that now exist, and that from such relatively modest beginnings as these, better international understanding will grow and flourish."

Publication begins with the first 1958 issue, of which 2500 copies will be printed. The exact date of appearance is uncertain, according to the announcement.

Professor George Herrmann of Columbia University will serve as editor.

Efforts to have the journal translated were initiated by the Applied Mechanics Division of ASME. The Society's Board on Technology approved the suggestion and arranged to secure the grant from the foundation.

Small but Growing

The Greek chemical industry, smallest in Europe, has enjoyed one of the fastest growth rates in recent years, reports *Chemical Week.* Since 1950, chemical output has jumped 125 per cent.

MIDWEST ENGINEER
Advertisers' Index

Inland Steel Building Has Unique Interior

The first major office building in the United States to be built with a "totally useful" interior is completed—the Inland Steel Building in Chicago.

Clear span floors of 10,000 sq. ft. each —the largest unobstructed floor space of any tall building ever built—are provided by a unique design. The exterior steel columns that carry the weight of the structure are located on the outside of the steel-and-glass curtain wall while elevators, fire stairs and risers for water, power and heat are housed in an exterior separate service shaft.

Through the use of movable interior walls the column-free floors have been divided into offices of the exact size needed for the activities to be conducted in them.

Architecturally, Inland Steel thus represents the first complete synthesis of exterior and interior "curtain wall" prefabricated construction and is, thereby, the first U. S. building ever to take full advantage of modern post-war construction techniques. The architects, Skidmore, Owings, and Merrill, estimate that this "total planning" of the structure will make Inland's floor space about "17 per cent more efficient than average."

Each 177 ft. x 58 ft. rectangular office floor occupied by Inland Steel is being partitioned entirely with flexible, modern movable walls. Manufactured by the E. F. Hauserman Company, Cleveland, Ohio, these easily-maintained and easily-relocated interior walls are of the very latest type, utilizing extruded aluminum posts and panels of baked enamel steel alternated with panels of obscure (unpolished) plate glass.

The Hauserman modular interior partition system integrates perfectly with the hung ceiling and the cellular steel floor, as well as with the exterior curtain wall structure. All components, exterior and interior, were pre-built to fit perfectly together.

During construction, each floor was "assembled" as a unit. First, the hung acoustical steel ceiling was installed. Then the carpeting was laid across the entire floor area. Finally, sections of the interior partition system were stacked strategically across the carpeted floor area. After clips were attached to floor and ceiling, posts and panels were set up, working from one end of the floor to the other. This simple, logical method of constructing the interior offices was made possible because there was no mess involved in the use of the prefabricated walls. Also, many hundreds of work-hours were saved on each floor, as compared to the time that would have been required had fixed plaster-and-lath walls been used.

The Hauserman partitions are installed off-the-ceiling (open at top) in the Inland Steel Building, to lend a feeling of openness to the wide floor areas, at the same time giving ample privacy. In use, it will be possible to make extensive changes in office space over a weekend without disturbing office routine, Hauserman notes.

Inland Steel, owner of the building, expects that the modern engineering and architectural principles which are built into its new home office building, together with the unique flexibility of its floor arrangement, will give this modern structure an exceptionally long economic and physical life.

Gold Insulation

The Ford Motor Company in Dearborn Mich. is studying different metals as a means of insulating automobile windshields and window glass against summer heat rays, reports *Chemical Week*. Engineers there have found that a film of pure gold (about 1/30,000 the thickness of the human hair) filters out the heat-producing rays and lets cooler light beams pass through.

Suds Fight Fire

Billowing piles of soapsuds are now being used to fight fires in coal mines, reports *Chemical Week*. The technique was developed by the British Ministry of Power. In case of fire, a wall of detergent foam is laid down, and blown toward the flames. The bubbly wall of foam helps smother the fire by excluding air and by dampening the area.

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Western Society of Engineers

84 E. Randolph Street
Chicago 1, Illinois

How many of these electric helpers have you added since 1947?... asks LITTLE BILL

☐a ☐b ☐c ☐d ☐e ☐f ☐g ☐h

You're an average family if —in the postwar years you've added six new electrical appliances. Shown here are a few typical examples.

This is why you're using far more electricity nowadays than you did a few years ago. And why life is a lot easier. But of all the things you buy today, electricity has gone up *less* than almost anything else.

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See how little it costs to run each of these electric helpers.

a—Your TV set—2 hours for 1¢. The world's finest entertainment for pennies a day.

b—Air conditioner—only 2½¢ an hour. This ¾ ton unit cleans, cools, dehumidifies air in 2 big rooms.

c—Record player—5 hours for 1¢. 10 long-playing albums played for a penny's worth of electricity.

d—150-watt lamp—3 hours 1¢. Good reading light costs only pennies a week.

e—Radio—5 hours for 1¢. Entertains you while you work for just pennies a week.

f—Floor polisher—2¾ hours for 1¢. Waxes, polishes floors to a bright, shiny finish—saves hours of work.

Other appliances shown include: (g) electric train —8 hours of fun for just 1¢. **(h) electric clock** — accurate time for a penny a week.

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